Water Walk

Purpose

To become familiar with the hydrology of your locale

Overview

Students will visit the Hydrology Study Site, conduct a visual survey to discover information about local land use and water quality, and document their findings by mapping and profiling the water body. They will use this initial investigation to raise questions about local land use and/or water chemistry issues that may require further study.

Time

Field trip time plus one class period

Skill Level

All

Key Concepts

- Surface water exists in many forms, such as: ponds, lakes, rivers, and snow cover.
- Water characteristics are closely related to the characteristics of the surrounding land.
- Water moves from one location to another.
- Surface water has many observable characteristics, such as: color, smell, flow, and shape.

Skills

- *Observing* water at the study site
- *Describing* water at the study site
- *Organizing* observations
- *Asking* questions based on observations at the study site
- *Identifying* relationships between land characteristics and water characteristics
- *Communicating* initial observations and interpretations orally, in writing and graphically
- *Mapping* the hydrology of the study site

Materials and Tools

- Drawing materials and tools for creating pictures and maps
- GLOBE Science Notebooks and pens
- Still or video cameras for photography
- Compass and measuring sticks or twine
- Clear plastic cups or bottles for observing the clarity and color of the water

Preparation

Obtain topographic maps and satellite imagery of your study site.

Prerequisites

None

Background

Your body of water is part of a catchment basin. A watershed delineates a catchment basin, the area drained by a river and its tributaries. The topography of the area determines the shape of the watershed. The surrounding land and the uses of this land – towns, cities, highways, agricultural, livestock, timber harvesting, natural vegetation, etc.– influences the water chemistry of bodies of water within the watershed.

Many factors can affect the characteristics of the water in a river system, lake, or pond. Characteristics of water include: temperature, color, shape, etc. In the protocol, you will be collecting data about water quality as measured by dissolved oxygen, pH, alkalinity and electrical conductivity. Field observations increase the students' ability to conceptualize links between land characteristics and water characteristics. This activity is an introduction to your hydrology study site and lays the foundation for subsequent

hydrology learning activities and the hydrology protocols.

What To Do and How To Do It

1. Ask students about their knowledge of local bodies of water. Begin with questions such as:
   Is there a lake, river, pond or stream that you visit?
   What is your favorite past-time at this place?
   Why is this body of water important to you?
2. Take your students to the Hydrology Study Site. Remind them of safety issues.

For beginning levels:

3. For the younger students, the goal is to have the students walk around, observe and ask questions about the water in their study site. This includes noticing the flow of rivers or streams, the presence of ponds or lakes, residual water from precipitation, springs and soil moisture. Encourage your students to focus on water in all its forms as they walk around the study site. Take a container and collect a sample of the water. Ask students to observe the color of the water, what they see in the water, whether the water is moving and how fast, what is near the water, whether they can hear the water while they are quiet, whether the water has a smell, whether the water is clear or cloudy, etc.
4. Have your students draw pictures and/or take notes about the location and size of the study site. Compare the water location to other features on their study site such as trees, hills, etc. Have your students ask questions about where the water came from.

For intermediate and advanced levels:

3. Assign teams of students to survey different sections of the site. In teams composed of a journalist, a mapper, a sketcher, and a photographer, students should begin to document what they observe about their section. What is the appearance, smell, nature of the water in their section? Bordering lands should be noted: urban, agricultural, industrial, residential, wooded, swamp, etc. Students should map the general contours and characteristics of their sections and record the wildlife and plants in and around its water. What is the slope of the land adjacent to their section of water?
4. Back in the classroom, students should create a composite display of all the maps. Look for similarities and differences and discuss observed patterns. Based on their observations, encourage students to think about how the water got to this location, how it flows through the study site, where it goes from there, how the area surrounding the water influences the quality of the water particularly during periods of rain, snowmelt, flooding, etc. What questions do they have? Record them on a poster on the classroom wall.

Students at the University of Arizona performing pH, conductivity, and alkalinity measurements.

5. In addition, ask the students to discuss some of the following:
   What land use activities did you observe and list? How do you think these activities would change the water characteristics? Would these activities influence water quality?
   What type of water appearance was recorded most often and what might this indicate about the water quality?
   Was there evidence of human uses of the water? Evidence of wildlife and other animals using the water?

Further Investigations

1. As students visit the site monthly to collect data for the hydrology protocol, remind them of their observations during this activity and ask them to note changes in their GLOBE Science Notebooks.
2. The quantity and the quality of water is a global issue. Take your composite information about your Hydrology Site and prepare a written description of the features and characteristics, including such materials as graphs, of your hydrology data. Contact another school that has reported data and make arrangements to have them graph their hydrology data. Exchange and compare the graphs of the data from both schools. Each should then prepare a written description of the other's Hydrology Study Site based on the comparisons. Then exchange the written descriptions and discuss how the extrapolated descriptions compare with the original descriptions. Explore the things which can and cannot be concluded from the data.

Student Assessment

Have students create a visual display of what they know about their body of water, including surrounding land uses and their impacts on the quality of the water (both positive and negative) in ways that affect fish and animals, including humans, that depend on the water. Share this with others at school and in the community.

Acknowledgment

Adapted from The Aspen Global Change Institute's Ground Truth Studies Teacher Handbook, *River Walk*, and Project WET's *Stream Sense*.